

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: DAWN GARRETT Examiner #: 76107 Date: 11/15/2004  
 Art Unit: 1774 Phone Number: 301-272-1523 Serial Number: 10/715,106  
 Mail Box and Bldg/Room Location: Remzen 10A54 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Electroluminescent Element And Light Emitting Device  
 Inventors (please provide full names): Harue Nakashima, Satoshi Seo,  
Takako Takasu, Hiroko Yumazaki  
 Earliest Priority Filing Date: JP 2002-337623 11/21/2002

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

*Please search Formula 1 Compound attached.*

*Thank you*

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## STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher: <u>EL</u>	NA Sequence (#) _____	STN <u>\$ 262.49</u>
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) <u>✓ (1)</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic <u>✓ (and)</u>	Dr.Link _____
Date Completed: <u>11-19-04</u>	Litigation <u>✓</u>	Lexis/Nexis _____
Searcher Prep & Review Time: <u>5</u>	Fulltext _____	Sequence Systems _____
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=> file reg

FILE 'REGISTRY'

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FILE 'HCAPLUS'

L1 10328 S NAKASHIMA ?/AU  
L2 10134 S SEO ?/AU  
L3 2087 S TAKASU ?/AU  
L4 32515 S YAMAZAKI ?/AU  
L5 1 S L1 AND L2 AND L3 AND L4  
SEL L5 1 RN

FILE 'REGISTRY'

L6 8 S E1-E8  
L7 4 S L6 AND 2<NRRS  
L8 4 S L6 NOT L7

FILE 'HCA'

L9 22 S L7  
L10 87579 S (ELECTROLUM!N? OR ORGANOLUM!N? OR (ELECTRO OR ORGANO OR  
L11 9 S L9 AND L10

FILE 'LREGISTRY'

L12 STR 332047-97-9

FILE 'REGISTRY'

L13 0 S L12  
L14 22 S L12 FUL  
SAV L14 GAR106/A

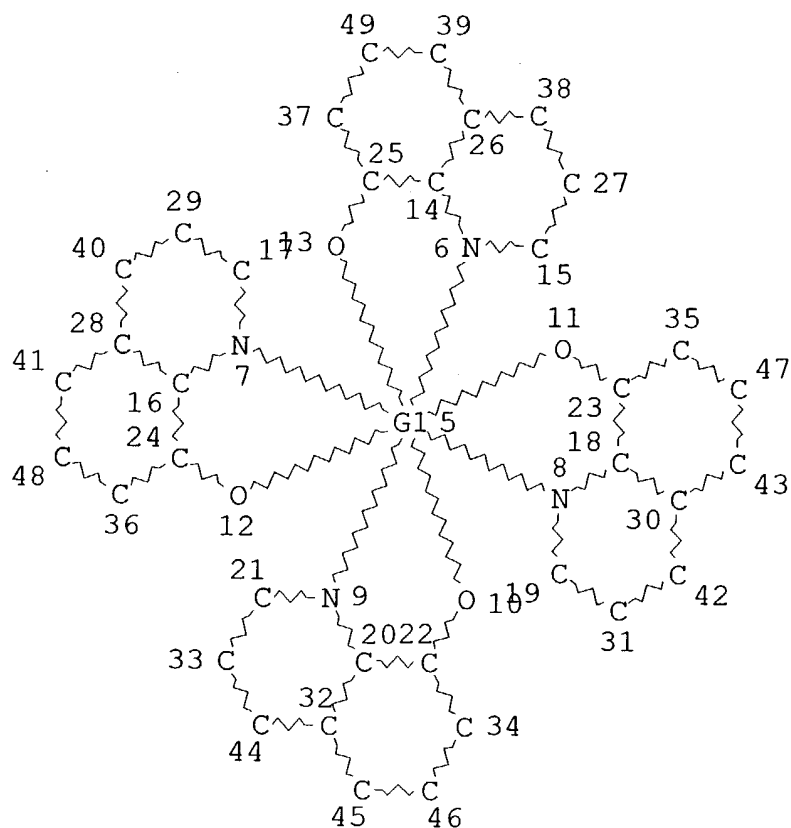
FILE 'HCA'

L15 34 S L14  
L16 9 S L10 AND L15  
L17 9 S L11 OR L16  
L18 25 S (L9 OR L15) NOT L17

FILE 'REGISTRY'

=> d l14 que stat

L12 STR



VAR G1=TI/ZR/HF  
 NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 45

STEREO ATTRIBUTES: NONE  
 L14 22 SEA FILE=REGISTRY SSS FUL L12

100.0% PROCESSED 147 ITERATIONS  
 SEARCH TIME: 00.00.01

22 ANSWERS

=> file hca

FILE 'HCA'

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L17 ANSWER 1 OF 9 HCA COPYRIGHT 2004 ACS on STN

141:322338 Materials and structures for enhancing the performance of organic **light-emitting** devices. Thompson, Mark E.; Garon, Simona; Kwong, Raymond; Brooks, Jason; Lu, Min-hao Michael (USA). U.S. Pat. Appl. Publ. US 2004197601 A1 20041007, 18 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-405009 20030401.

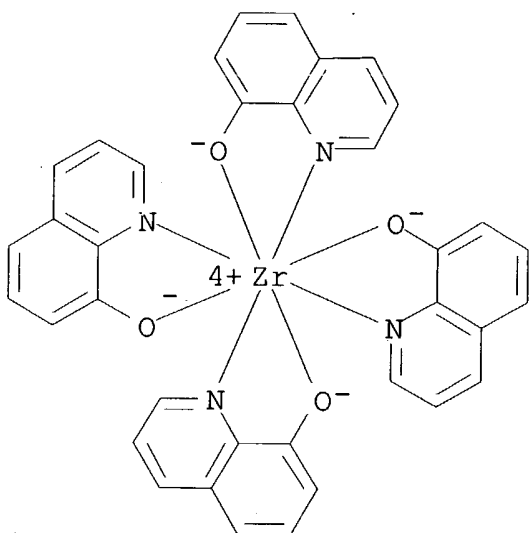
AB **Light-emitting** devices comprising an anode; a cathode; a first org. layer, disposed between the anode and the cathode, capable of phosphorescent emissive when a voltage is applied between the anode and the cathode are described which are provided with a second org. layer between the first org. layer and the cathode, the second org. layer being in contact with the cathode. The second org. layer may comprise a complex of a metal selected from Ti, Zr, Hf, Nb, Re, Sn, and Ge with 4 (un)substituted quinolinolate ligands; a complex of a metal selected from Ca, Sr, Ba, Ti, Zr, Hf, V, Nb, Mo, W, Mn, Tc, Re, Fe, Ru, Os, Ni, Pd, Pt, Zn, Cd, Hg, Ge, Sn, and Pd with 2-4 (un)substituted quinolinolate ligands, and optionally other ligands. More generally, the second org. layer may comprise a material having a dipole moment .ltorsim.2.0 debyes, such that the device has an unmodified external quantum efficiency of .gtorsim.3% and a lifetime of .gtorsim.1000 h at an initial photon flux of about 1018 photons/sr-sec. The second org. layer may be in direct contact with the cathode, or there may be a sep. org. layer between the second org. layer and the cathode.

IT 17457-88-4 21392-78-9

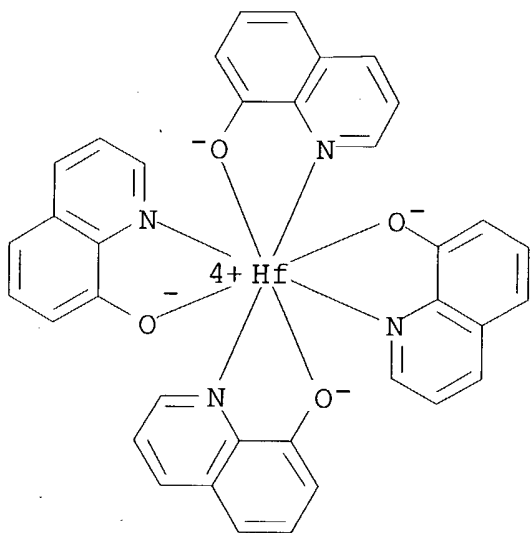
(org. **light-emitting** devices with org.  
emission-enhancing layers adjacent to the emitting layer)

RN 17457-88-4 HCA

CN Zirconium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA  
INDEX NAME)



RN 21392-78-9 HCA  
 CN Hafnium, tetrakis(8-quinolinolato-N1,O8)- (9CI) (CA INDEX NAME)



IC ICM H05B033-12  
 NCL 428690000; 428917000; 428212000; 313504000; 313506000  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 29, 76  
 ST quinolinolate deriv complex org **electroluminescent** device  
 performance enhancement; metal complex org  
**electroluminescent** device performance enhancement

IT 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 7439-89-6D, Iron, complexes with quinolinolate derivs. 7439-96-5D, Manganese, complexes with quinolinolate derivs. 7439-97-6D, Mercury, complexes with quinolinolate derivs. 7439-98-7D, Molybdenum, complexes with quinolinolate derivs. 7440-02-0D, Nickel, complexes with quinolinolate derivs. 7440-03-1D, Niobium, complexes with quinolinolate derivs. 7440-04-2D, Osmium, complexes with quinolinolate derivs. 7440-05-3D, Palladium, complexes with quinolinolate derivs. 7440-06-4D, Platinum, complexes with quinolinolate derivs. 7440-15-5D, Rhenium, complexes with quinolinolate derivs. 7440-18-8D, Ruthenium, complexes with quinolinolate derivs. 7440-24-6D, Strontium, complexes with quinolinolate derivs. 7440-26-8D, Technetium, complexes with quinolinolate derivs. 7440-31-5D, Tin, complexes with quinolinolate derivs. 7440-32-6D, Titanium, complexes with quinolinolate derivs. 7440-33-7D, Tungsten, complexes with quinolinolate derivs. 7440-39-3D, Barium, complexes with quinolinolate derivs. 7440-43-9D, Cadmium, complexes with quinolinolate derivs. 7440-56-4D, Germanium, complexes with quinolinolate derivs. 7440-62-2D, Vanadium, complexes with quinolinolate derivs. 7440-66-6D, Zinc, complexes with quinolinolate derivs. 7440-70-2D, Calcium, complexes with quinolinolate derivs. 14642-34-3 **17457-88-4**  
**21392-78-9** 58328-31-7, 4,4'-Bis(N-carbazolyl)biphenyl  
146162-54-1, BA1q

(org. **light-emitting** devices with org.  
emission-enhancing layers adjacent to the emitting layer)

IT 94928-86-6, fac-Tris(2-phenylpyridine)iridium  
(org. **light-emitting** devices with org.  
emission-enhancing layers adjacent to the emitting layer)

L17 ANSWER 2 OF 9 HCA COPYRIGHT 2004 ACS on STN

141:131055 **Electroluminescent** materials and devices using organometallic complex with Ti, Zr, Hf, V, Nb or Ta. Kathirgamanathan, Poopathy; Price, Richard; Ganeshamurugan, Subramaniam; Paramaswara, Gnanamoly; Kumaraverl, Muttulingham; Partheepan, Arumugam; Selvaranjan, Selvadurai; Antipan-Lara, Juan; Surendrakumar, Sivagnanasundram (Elam-T Limited, UK). PCT Int. Appl. WO 2004058913 A1 20040715, 89 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-GB5573 20031219. PRIORITY: GB

2002-30072 20021224.

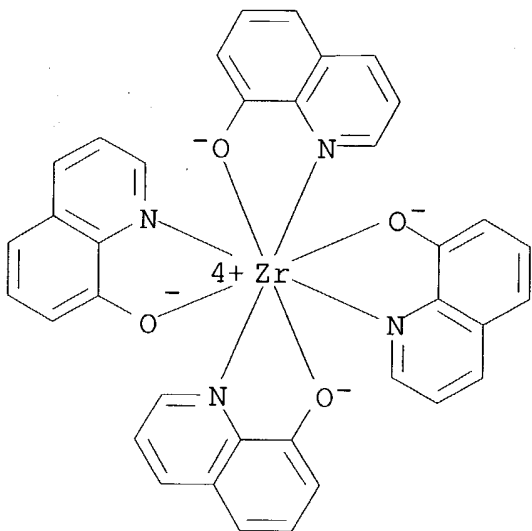
AB The invention refers to an organometallic complex in which the metal is Ti, Zr, Hf, V, Nb or Ta as an **electroluminescent** compd.

IT 17457-88-4

(**electroluminescent** materials and devices with organometallic complexes)

RN 17457-88-4 HCA

CN Zirconium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



IC ICM C09K011-06

ICS H05B033-14; H01L051-20; H01L051-30

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 29

ST **electroluminescent** device organometallic complex

IT **Electroluminescent** devices

(**electroluminescent** materials and devices with organometallic complexes)

IT Organometallic compounds

(**electroluminescent** materials and devices with organometallic complexes)

IT Luminescent substances

(**electroluminescent; electroluminescent** materials and devices with organometallic complexes)

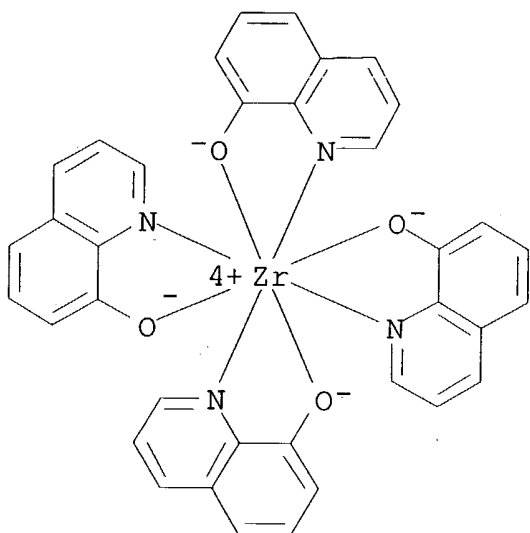
IT 17457-88-4

(**electroluminescent** materials and devices with organometallic complexes)

L17 ANSWER 3 OF 9 HCA COPYRIGHT 2004 ACS on STN

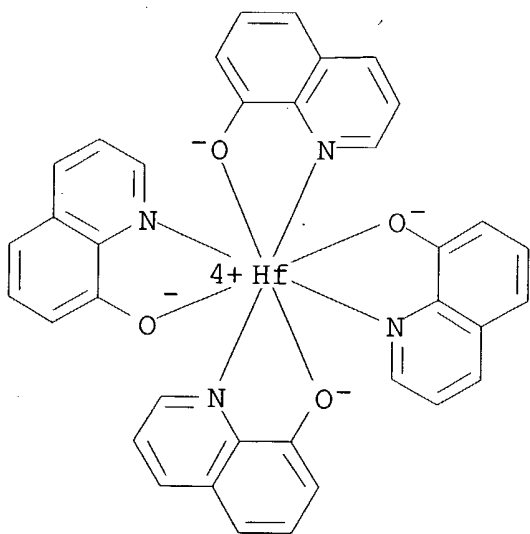
- 141:14283 **Electroluminescent device and light-emitting device.** Nakashima, Harue; Seo, Satoshi; Takasu, Takako; Yamazaki, Hiroko (Semiconductor Energy Laboratory Co., Ltd, Japan). PCT Int. Appl. WO 2004046275 A1 20040603, 50 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2003-JP14381 20031112. PRIORITY: JP 2002-337623 20021121.
- AB The invention relates to an **electroluminescent** device fabricated by using a material suitable also for a host material, having a good film-formability and an excellent carrier transporting ability, and capable of **emitting light** in the solid state. The **electroluminescent** device comprises a pair of electrodes and an **electroluminescent** layer disposed between the electrodes. The **electroluminescent** layer partly comprises a complex of a metal in Group IV of the element periodic table because such a metal complex has a good film-formability and an excellent carrier transporting ability and **emits light** even in the solid state. Since the emission wavelength of the complex of a metal in Group IV is longer than that of conventional host materials (Alq3), the **electroluminescent** layer can be formed of a combination of the metal complex and a guest material capable of **emitting red light**.
- IT 17457-88-4P, Tetrakis(8-hydroxyquinolinato)zirconium  
21392-78-9P, Tetrakis(8-hydroxyquinolinato)hafnium  
198489-29-1P, Tetrakis(2-methyl-8-quinolinato)zirconium  
332047-97-9P, Tetrakis(2-methyl-8-quinolinato)hafnium  
(**electroluminescent** device comprising 8-quinolinolato Group IV metal complex in **light emitting** layer)
- RN 17457-88-4 HCA
- CN Zirconium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)





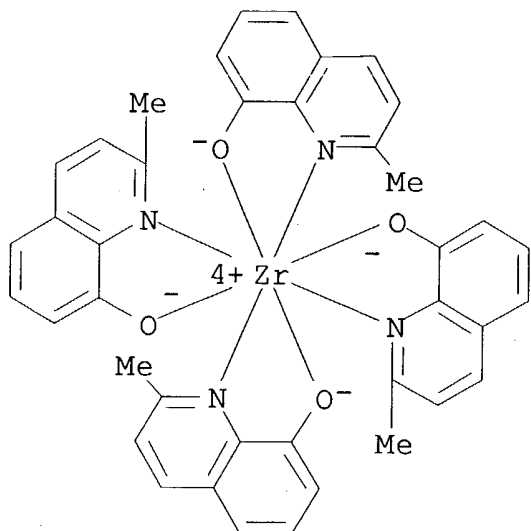
RN 21392-78-9 HCA

CN Hafnium, tetrakis(8-quinolinolato-N1,O8)- (9CI) (CA INDEX NAME)



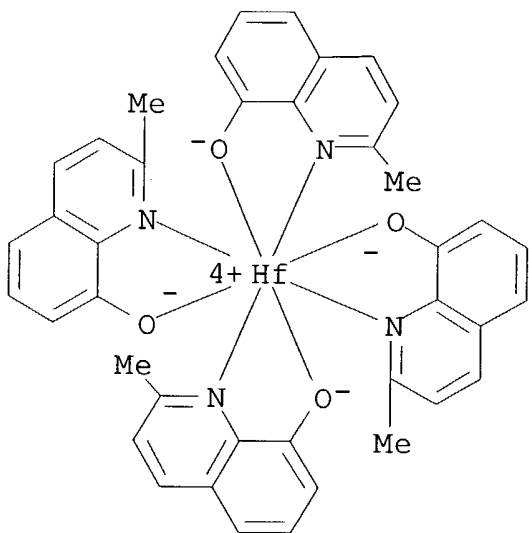
RN 198489-29-1 HCA

CN Zirconium, tetrakis(2-methyl-8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



RN 332047-97-9 HCA

CN Hafnium, tetrakis(2-methyl-8-quinolinolato-.kappa.N1,.kappa.O8)-  
(9CI) (CA INDEX NAME)



IC ICM C09K011-06

ICS H05B033-14

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST **electroluminescent** device Group IV metal complex host material

IT **Electroluminescent** devices

- (displays; **electroluminescent** device comprising 8-quinolinolato Group IV metal complex in **light emitting** layer)
- IT **Electroluminescent** devices  
(**electroluminescent** device comprising 8-quinolinolato Group IV metal complex in **light emitting** layer)
- IT Luminescent substances  
(**electroluminescent**, red-emitting; **electroluminescent** device comprising 8-quinolinolato Group IV metal complex in **light emitting** layer)
- IT Luminescent screens  
(**electroluminescent**; **electroluminescent** device comprising 8-quinolinolato Group IV metal complex in **light emitting** layer)
- IT 826-81-3P, 2-Methyl-8-hydroxyquinoline 17457-88-4P, Tetrakis(8-hydroxyquinolinato)zirconium 21392-78-9P, Tetrakis(8-hydroxyquinolinato)hafnium 198489-29-1P, Tetrakis(2-methyl-8-quinolinato)zirconium 332047-97-9P, Tetrakis(2-methyl-8-quinolinato)hafnium  
(**electroluminescent** device comprising 8-quinolinolato Group IV metal complex in **light emitting** layer)
- IT 148-24-3, 8-Hydroxyquinoline, reactions 10026-11-6, Zirconium chloride 13499-05-3, Hafnium chloride  
(**electroluminescent** device comprising 8-quinolinolato Group IV metal complex in **light emitting** layer)

L17 ANSWER 4 OF 9 HCA COPYRIGHT 2004 ACS on STN

139:331167 Composition of doped organic carrier transport materials.

Thompson, Mark (The University of Southern California, USA). PCT Int. Appl. WO 2003088271 A1 20031023, 42 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English).

CODEN: PIXXD2. APPLICATION: WO 2002-US27202 20020827. PRIORITY: US 2002-PV370676 20020408.

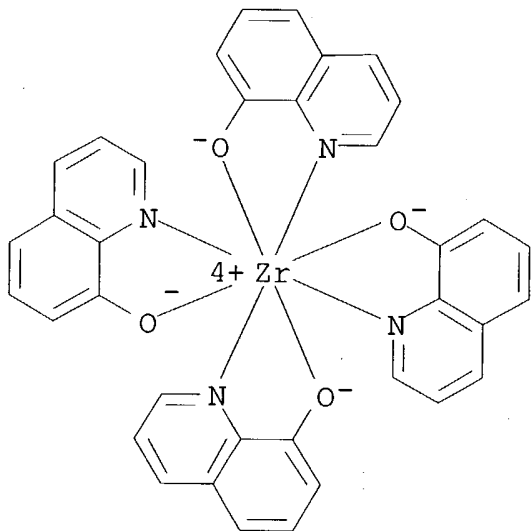
AB The invention relates to the compn. of doped org. carrier transport materials, where an org. matrix is doped with an organometallic dopant. For example, the invention uses phenanthrenes and triazoles as matrix materials and cobaltenes and chromacenes as dopants.

IT 17457-88-4 21392-78-9

(matrix material; compn. of doped org. carrier transport materials)

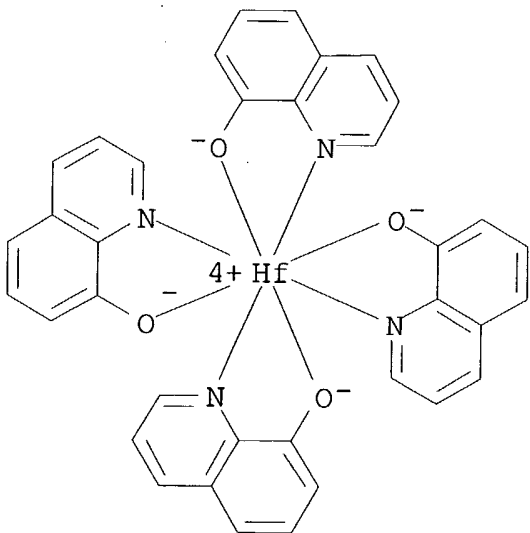
RN 17457-88-4 HCA

CN Zirconium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



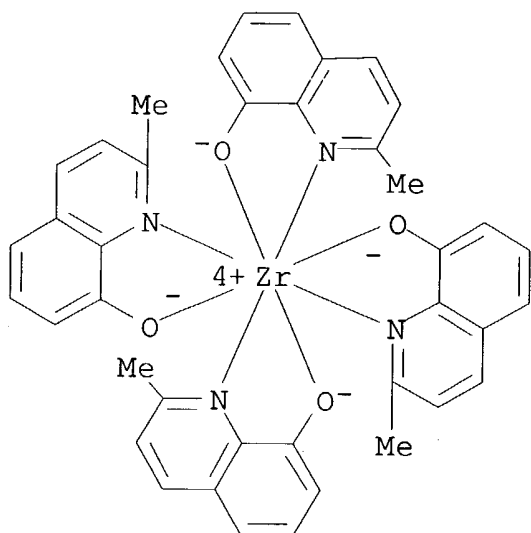
RN 21392-78-9 HCA

CN Hafnium, tetrakis(8-quinolinolato-N1,O8)- (9CI) (CA INDEX NAME)



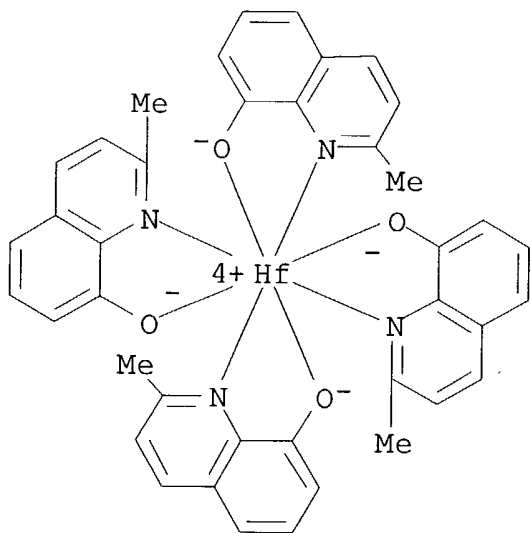
IC ICM H01B001-00  
ICS H05B033-00

- CC 76-2 (Electric Phenomena)  
Section cross-reference(s): 38, 78
- IT **Electroluminescent** devices  
(org.; compn. of doped org. carrier transport materials)
- IT 51-17-2D, Benzimidazole, derivs. 86-74-8D, Carbazole, derivs.  
86-74-8D, Carbazole, indolo- derivs. 256-96-2D, Iminostilbene,  
derivs. 288-32-4D, Imidazole, derivs. 574-93-6D, Phthalocyanine,  
derivs. 2041-08-9, Octaphenylcyclooctatetraene 2085-33-8,  
Tris(8-hydroxyquinoline) aluminum 4733-39-5, Bathocuproine  
11120-54-0D, Oxadiazole, derivs. 12654-97-6D, Triazine, derivs.  
12678-01-2D, Phenanthroline, derivs. 16152-10-6,  
3,5-Diphenyl-4-(1-naphthyl)-1,2,4-triazole **17457-88-4**  
**21392-78-9** 37306-44-8D, Triazole, derivs. 58328-31-7,  
4,4'-N,N'-Dicarbazolylbiphenyl 65181-78-4, TPD 96638-49-2D,  
Polyphenylenevinylene, cyano-substituted 107528-27-8, .beta.-NPD  
123847-85-8, .alpha.-NPD 184293-32-1  
(matrix material; compn. of doped org. carrier transport  
materials)
- L17 ANSWER 5 OF 9 HCA COPYRIGHT 2004 ACS on STN
- 134:273317 Color-tunable organic **light emitting**  
devices. Thompson, Mark; Bulovic, Vladimir; Forrest, Stephen R.;  
Shoustikov, Andrei (The University of Southern California, USA; The  
Trustees of Princeton University). U.S. US 6210814 B1 20010403, 27  
pp., Cont.-in-part of U.S. 5,333,766. (English). CODEN: USXXAM.  
APPLICATION: US 1998-152962 19980914. PRIORITY: US 1998-58142  
19980410.
- AB Org. **light-emitting** devices in which the  
**light-emitting** layer comprises a host material, an  
**electroluminescent** dopant in the host material, and a  
polarization mol., present as a dopant in the host material and  
having a dipole moment, that affects the wavelength of **light**  
**emitted** when the emissive dopant mol. luminesces, are  
described in which the polarization mol. is selected from the group  
consisting of N,N-dimethylparanitroaniline, polyphenyl derivs.,  
stilbene derivs., fluorene derivs., and diphenylacetylene derivs.  
Preferably, the host material is a metalorg. complex.
- IT **198489-29-1 332047-97-9**, Tetrakis(2-methyl-8-  
Quinolinolato)hafnium  
(tunable org. **light-emitting** devices)
- RN 198489-29-1 HCA
- CN Zirconium, tetrakis(2-methyl-8-quinolinolato-.kappa.N1,.kappa.O8)-  
(9CI) (CA INDEX NAME)



RN 332047-97-9 HCA

CN Hafnium, tetrakis(2-methyl-8-quinolinolato-.kappa.N1,.kappa.O8)-  
(9CI) (CA INDEX NAME)



IC ICM H05B033-12

NCL 428690000

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

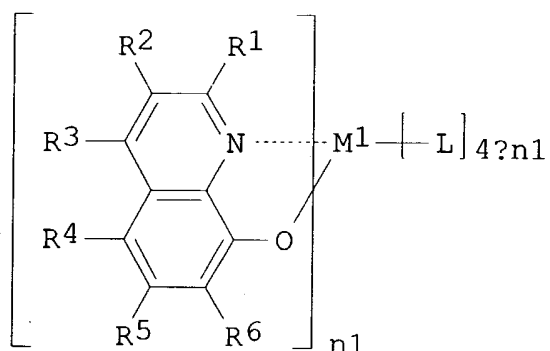
Section cross-reference(s): 76

ST tunable org light emitting device

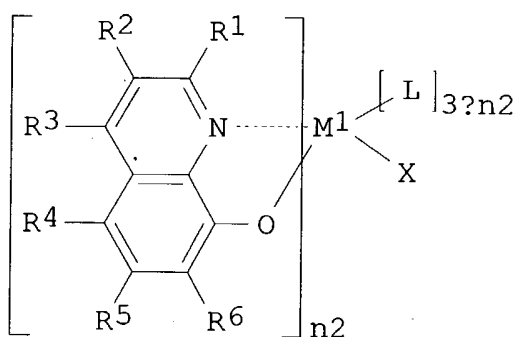
IT Electroluminescent devices

- (org.; tunable org. **light-emitting** devices)
- IT 148-24-3D, 8-Quinolinol, metal compds., uses 826-81-3D,  
2-Methyl-8-Quinolinol, metal compds. 2085-33-8,  
Tris(8-hydroxyquinolinato)aluminum  
(tunable org. **light-emitting** devices)
- IT 100-10-7 100-17-4 100-23-2 874-90-8 1197-19-9 1472-68-0  
2396-05-6 2523-48-0, 9H-Fluorene-2-carbonitrile 4584-57-0  
5972-04-3 19221-04-6 39082-40-1 51325-95-2, DCM2 52364-50-8  
54273-31-3 54961-21-6 62197-66-4 119984-89-3 125138-98-9  
134249-47-1  
(tunable org. **light-emitting** devices)
- IT 198489-29-1 332047-97-9, Tetrakis(2-methyl-8-  
Quinolinolato)hafnium  
(tunable org. **light-emitting** devices)
- L17 ANSWER 6 OF 9 HCA COPYRIGHT 2004 ACS on STN  
134:245058 Organic **electroluminescent** devices. Suzuki,  
Mutsuko; Fukuyama, Masao; Hori, Yoshikazu; Kudo, Yuji (Matsushita  
Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP  
2001076879 A2 20010323, 8 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1999-252426 19990907.

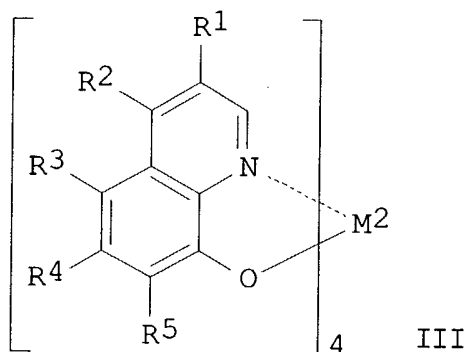
GI



I



II



III

AB The devices comprise a pair of a cathode and an anode interposing an **electroluminescent** laminate contg. an electron transport layer contg. I, II and III (M1,2 = tetravalent metal; n1 = 1-3; n2 = 1, 2; R1-6 = H, halo, halogenized alkyl, nitro, alkyl, alkoxy, aralkyl, alkenyl, carboxy, (substituted) aryl, (substituted) cycloalkyl, (substituted) heterocyclic, dialkylamino, diarylamino, di-Ph, naphthyl; L = H, alkyl, alkoxy, (substituted) aryl; (substituted) cycloalkyl, (substituted) heterocyclic; X = halo).

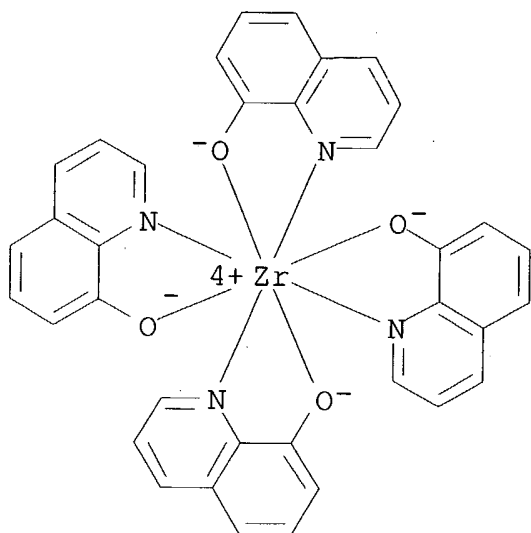
IT 17457-88-4

(org. **electroluminescent** devices contg. metal org. complexes)

RN 17457-88-4 HCA

CN Zirconium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)





- IC ICM H05B033-22  
ICS C09K011-06; H05B033-14
- CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 29
- ST org **electroluminescent** device electron transport material;  
LED org electron transport material
- IT Anodes  
Cathodes  
Electroluminescent devices  
Glass substrates  
Substituent effects  
(org. **electroluminescent** devices contg. metal org. complexes)
- IT 2085-33-8, Tris(8-quinolinolato)aluminum 12798-95-7 13978-85-3  
**17457-88-4** 19568-50-4 23653-17-0 49753-54-0, TPT  
142289-08-5 330584-75-3 330584-77-5  
(org. **electroluminescent** devices contg. metal org. complexes)
- L17 ANSWER 7 OF 9 HCA COPYRIGHT 2004 ACS on STN
- 134:186032 Organic **electroluminescent** device having metal hydroquinoline complex in charge-transfer layer. Suzuki, Mutsumi; Fukuyama, Masao; Hori, Yoshikazu; Kudo, Yuji; Kimura, Toshihide; Miki, Tetsuzo (Matsushita Electric Industrial Co., Ltd., Japan; Hodogaya Chemical Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2001043976 A2 20010216, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-218248 19990802.
- AB The org. **EL** device has org. layers including a

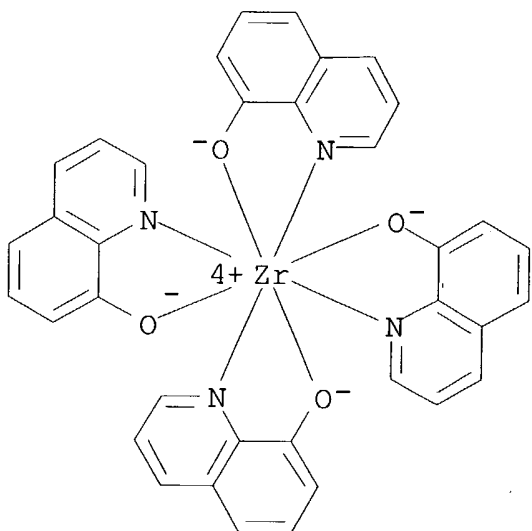
charge-transfer layer between a pair of electrodes, wherein the charge-transfer layer contains a metal complexed with four 8-hydroquinoline or 8-hydroquinoline deriv. ligands. The device contg. the metal complex in the charge-transfer layer shows the improved **light-emitting** efficiency and the high durability.

IT 17457-88-4 17500-80-0 326588-05-0  
326588-06-1 326588-08-3

(metal hydroquinoline complex in charge-transfer layer in electroluminescent device)

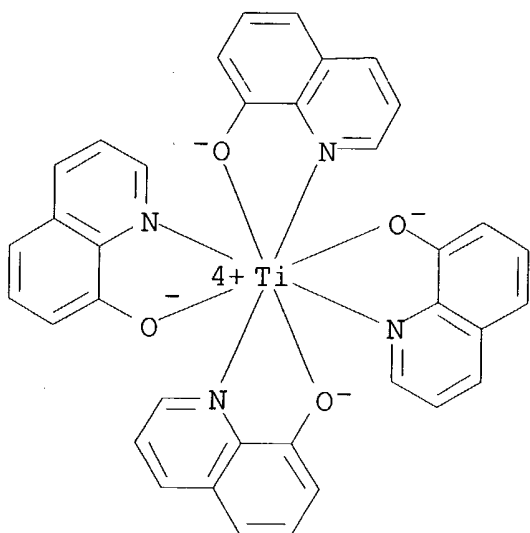
RN 17457-88-4 HCA

CN Zirconium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



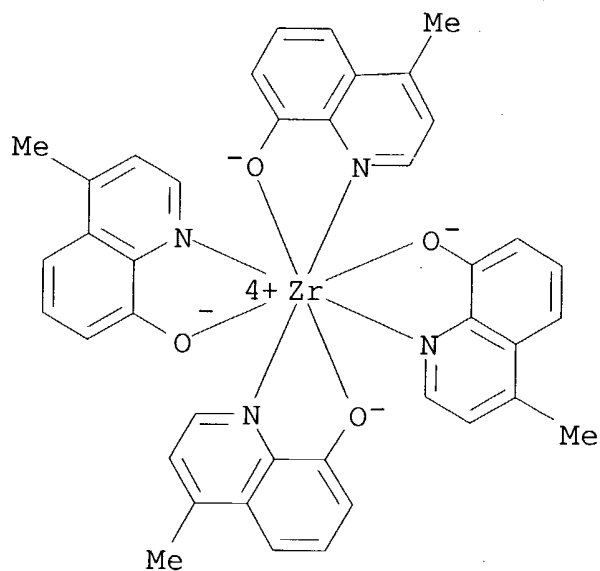
RN 17500-80-0 HCA

CN Titanium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



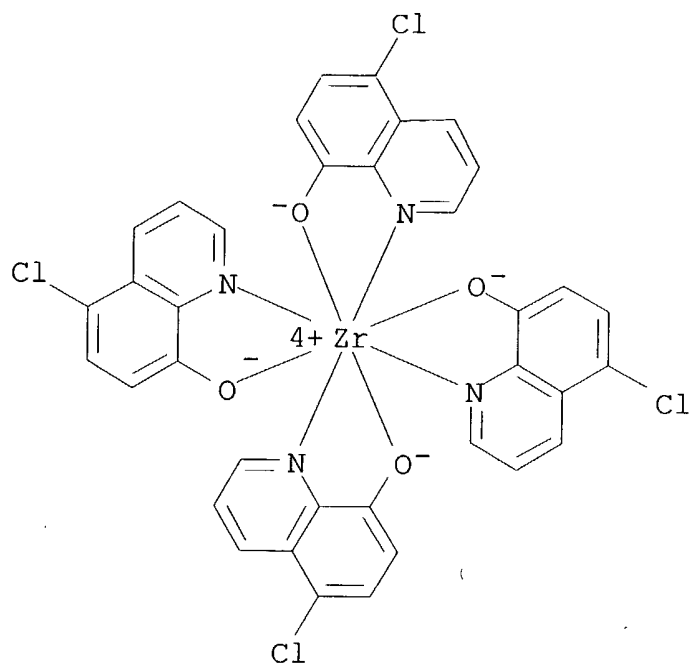
RN 326588-05-0 HCA

CN Zirconium, tetrakis(4-methyl-8-quinolinolato-.kappa.N1,.kappa.O8)-  
(9CI) (CA INDEX NAME)

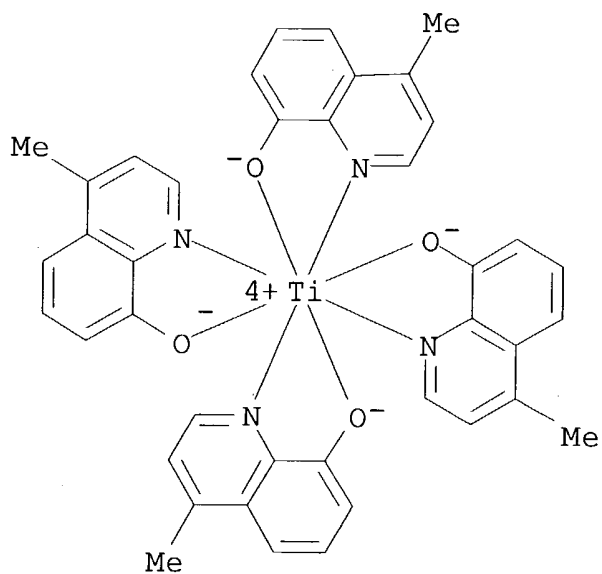


RN 326588-06-1 HCA

CN Zirconium, tetrakis(5-chloro-8-quinolinolato-.kappa.N1,.kappa.O8)-  
(9CI) (CA INDEX NAME)



RN 326588-08-3 HCA

CN Titanium, tetrakis(4-methyl-8-quinolinolato-.kappa.N1,.kappa.O8)-  
(9CI) (CA INDEX NAME)

IC ICM H05B033-14

ICS C09K011-06; H05B033-22

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
Section cross-reference(s): 73

ST org **electroluminescent** device metal hydroquinoline complex charge transfer layer

IT **Electroluminescent** devices  
(metal hydroquinoline complex in charge-transfer layer in **electroluminescent** device)

IT Optical imaging devices  
(org. **electroluminescent** device)

IT 17457-88-4 17500-80-0 326588-05-0  
326588-06-1 326588-08-3  
(metal hydroquinoline complex in charge-transfer layer in **electroluminescent** device)

L17 ANSWER 8 OF 9 HCA COPYRIGHT 2004 ACS on STN  
132:187445 Organometallic **light-emitting** substances, their manufacture, and organic **electroluminescent** devices using them. Kim, Young Kyu; Lee, Jae Kyung (Advanced Technical Research Institute, S. Korea). Jpn. Kokai Tokkyo Koho JP 2000053957 A2 20000222, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-176775 19990623. PRIORITY: KR 1998-23645 19980623.

GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

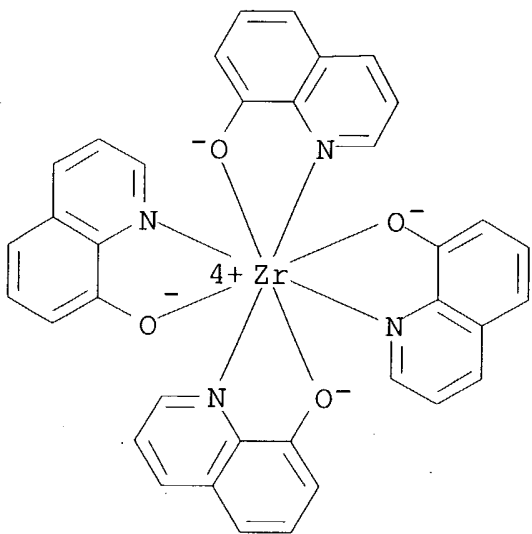
AB The **light-emitting** substances comprise 8-hydroxyquinoline metal complexes I, 8-hydroxyquinolinato-5-sulfonato metal complexes II, benzoxazole or benzothiazole metal complexes III, benzotriazole metal complexes IV, or benzoquinoline metal complexes V (M1, M4 = Li, Na, K, Zr, Si, Ti, Sn, Cs, Fr, Rb, Hf, Pr, Pa, Ge, Pb, Tm, Md; M2 = Li, Na, K, Ca, Be, Ga, Zn, Cd, Al, Cs, Fr, Rb, Be, Mg, Mn, Ti, Cu, Zr, Si, Hf, Pr, Pa, Ge, Sn, Pb, Tm, Md; M3 = Li<sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup>, Cs<sup>+</sup>, Fr<sup>+</sup>, Rb<sup>+</sup>, Ca<sup>2+</sup>, Be<sup>2+</sup>, Ga<sup>3+</sup>, Zn<sup>2+</sup>, Al<sup>3+</sup>, Mg<sup>2+</sup>, Mn<sup>2+</sup>, Ti<sup>2+</sup>, Cu<sup>2+</sup>; R = H, C1-10 alkyl; X, Y = H, Cl, F, I, Br, SO<sub>3</sub>H; A = H, F, Cl, Br, I; B = O, S, Se, Te; D = O, S; n = 1-4). 8-Hydroxyquinoline-5-sulfonato metal complexes II are manufd. by depositing or applying 8-hydroxyquinoline-5-sulfonato metal complexes I (M3 = H) and M3Z (Z = halo, OH). The **electroluminescent** devices have org. **light-emitting** layers contg. the substances. The substances show good thermal stability and give blue-, green-, or red-emitting devices with high luminescent efficiency.

IT 17457-88-4P  
(organometallic **light-emitting** substances and

their manuf. for org. **electroluminescent** devices)

RN 17457-88-4 HCA

CN Zirconium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



IC ICM C09K011-06

ICS C07D263-56; C07D277-64; C07D293-10; C07D293-12; H05B033-10; H05B033-14

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 78

ST organometallic compd **electroluminescent** device thermal stability; blue emitting **electroluminescent** device metal complex; green emitting **electroluminescent** device metal complex; red emitting **electroluminescent** device metal complex

IT **Electroluminescent** devices

(organometallic **light-emitting** substances and their manuf. for org. **electroluminescent** devices)

IT **17457-88-4P** 65764-88-7P 67244-73-9P 67244-77-3P  
115944-31-5P 259228-53-0P 259228-54-1P 259228-55-2P  
259228-56-3P 259228-57-4P 259228-58-5P 259228-59-6P  
259250-68-5P 259250-69-6P

(organometallic **light-emitting** substances and their manuf. for org. **electroluminescent** devices)

IT 14494-69-0P 22243-63-6P, Sodium 8-hydroxyquinoline-5-sulfonate  
108812-39-1P 169385-66-4P

(organometallic **light-emitting** substances and their manuf. for org. **electroluminescent** devices)

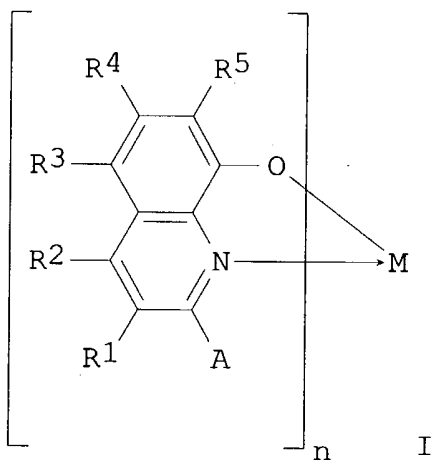
IT 84-88-8, 8-Hydroxyquinoline-5-sulfonic acid 148-24-3,

8-Hydroxyquinoline, reactions 835-64-3, 2-(2-Hydroxyphenyl)benzoxazole 1310-65-2, Lithium hydroxide 1310-73-2, Sodium hydroxide, reactions 4998-48-5 7646-85-7, Zinc dichloride, reactions 10026-11-6, Zirconium tetrachloride 16603-84-2, Aluminum dichloride 33155-90-7, 10-Hydroxybenzo[h]quinoline (organometallic **light-emitting** substances and their manuf. for org. **electroluminescent** devices)

L17 ANSWER 9 OF 9 HCA COPYRIGHT 2004 ACS on STN

127:364026 Quinoline electron-injection material and organic **electroluminescent** device using it. Enokida, Toshio (Toyo Ink Mfg. Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 09272865 A2 19971021 Heisei, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-84872 19960408.

GI

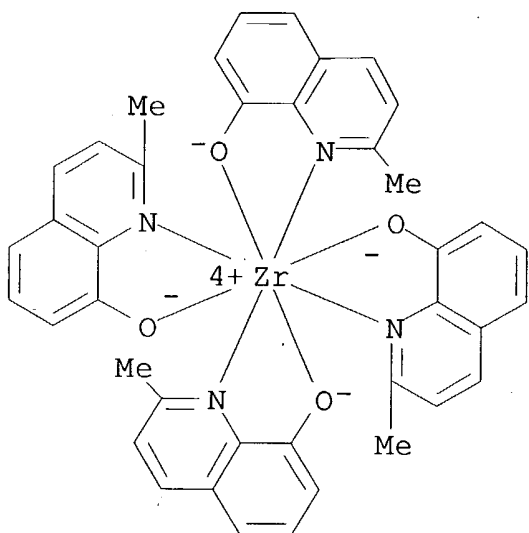


AB The material is quinoline derivs. I [A, R1-5 = H, halo, (substituted) alkoxy, amino, alkyl, cycloalkyl, aryl, or aryloxy (aryl and aryloxy may contain N); R1-5 may form (N-contg.) arom. ring; A .noteq. H; M = divalent or tetravalent metal; n = 2-4]. The device contg. the material in an electron-injecting layer is also claimed. The material shows high electron-transporting property and injection efficiency and the device shows high luminescent efficiency, brightness, and durability.

IT 198489-29-1

(org. **electroluminescent** device contg. quinoline electron-injection material)

RN 198489-29-1 HCA  
 CN Zirconium, tetrakis(2-methyl-8-quinolinolato-.kappa.N1,.kappa.O8)-  
 (9CI) (CA INDEX NAME)



IC ICM C09K011-06  
 ICS C08G061-02; H05B033-14; H05B033-22  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 27  
 ST quinoline electron injecting org **electroluminescent** device  
 IT **Electroluminescent** devices  
 (org. **electroluminescent** device contg. quinoline electron-injection material)  
 IT 14128-73-5 14855-54-0 16842-52-7 127796-91-2 198489-24-6  
 198489-25-7 198489-26-8 198489-27-9 198489-28-0  
**198489-29-1** 198489-30-4 198489-31-5 198489-32-6  
 (org. **electroluminescent** device contg. quinoline electron-injection material)

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L18 ANSWER 1 OF 25 HCA COPYRIGHT 2004 ACS on STN

TI Metal chelates in a photovoltaic device

L18 ANSWER 2 OF 25 HCA COPYRIGHT 2004 ACS on STN

TI Studies and developments of non-metallocene-based catalysts for syndiotactic polymerization of styrene

L18 ANSWER 3 OF 25 HCA COPYRIGHT 2004 ACS on STN



- TI Syndiotactic polymerization of styrene using titanium-8-hydroxyquinolate complex/methyl aluminoxane systems
- L18 ANSWER 4 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Synthesis, Structures, Bonding, and Ethylene Reactivity of Group 4 Metal Alkyl Complexes Incorporating 8-Quinolinolato Ligands
- L18 ANSWER 5 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Spectrophotometric determination of zirconium with 5-chloro-8-hydroxy-7-iodoquinoline
- L18 ANSWER 6 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI 5-Amylthio- and 5,7-diamylthio-8-hydroxyquinoline chelates
- L18 ANSWER 7 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Effect of alkylthio group as substituent in 8-hydroxyquinoline molecule on solubility of internal complexes
- L18 ANSWER 8 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Preparation and properties of 8-hydroxyquinoline compounds of some heavy metals
- L18 ANSWER 9 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Hyperfine quadrupole coupling and .pi. bonding in dodecahedral chelates of hafnium(IV)
- L18 ANSWER 10 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI X-ray K-absorption edge of zirconium in some complexes
- L18 ANSWER 11 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI X-ray crystal structure of tetrakis(8-quinolinolato)zirconium(IV), and dodecahedral M(AB)<sub>4</sub> system
- L18 ANSWER 12 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Absorption and emission spectra of 8-hydroxyquinoline with oxo cations of niobium, molybdenum, tungsten, titanium, and zirconium. II. Low temperature fluorescence and phosphorescence
- L18 ANSWER 13 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Tetra(8-quinolinolato)titanium, bis(8-quinolinolato)bis(salicylaldehydato)titanium, and tetra(salicylaldehydato)titanium
- L18 ANSWER 14 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Reactions of 8-quinolinol with covalent halides. III. Zirconium tetrafluoride and zirconium, hafnium, and thorium tetrachlorides
- L18 ANSWER 15 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Complexing process in the titanium(IV)-hydroxy-quinoline-chloroform

system

- L18 ANSWER 16 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Spectrophotometric determination of zirconium with 8-hydroxyquinoline
- L18 ANSWER 17 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Infrared spectra of the complexes of thorium, zirconium, and uranyl with 8-oxine and tributyl phosphate
- L18 ANSWER 18 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Flame photometry by a solvent extraction method. IV. Determination of Ti, Ga, and In by extraction of their oxinates with organic solvent
- L18 ANSWER 19 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Masking metal hydroxide and metal hydroxyquinolate precipitation with malic acid
- L18 ANSWER 20 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Metal salts of 8-hydroxyquinoline
- L18 ANSWER 21 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Removal of impurities from sulfates of organic bases
- L18 ANSWER 22 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI The preparation of hafnium 8-hydroxyquinolate of a given composition
- L18 ANSWER 23 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Absorption and fluorescence properties of the 8-quinolinol compounds of some elements of the 2nd, 3rd, and 4th Groups of the periodic system
- L18 ANSWER 24 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Zirconium 8-hydroxyquinolate, obtained from oxalic acid medium
- L18 ANSWER 25 OF 25 HCA COPYRIGHT 2004 ACS on STN  
TI Combinations of 8-hydroxyquinoline with alkali metals and zirconium

=> d l18 1,23 cbib abs hitstr hitrn

- L18 ANSWER 1 OF 25 HCA COPYRIGHT 2004 ACS on STN  
140:114240 Metal chelates in a photovoltaic device. Kathirgamanathan, Poopathy; Antipan-Lara, Juan; Partheepan, Arumugam (Elam-Limited, UK). PCT Int. Appl. WO 2004008554 A2 20040122, 59 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA,

CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English).  
 CODEN: PIXXD2. APPLICATION: WO 2003-GB3035 20030714. PRIORITY: GB 2002-16154 20020712.

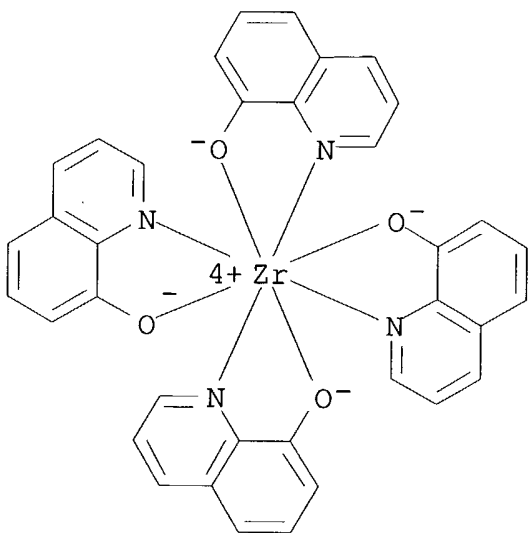
AB A photovoltaic device uses a metal chelate as the photovoltaic element. The device comprises sequentially (1) a first electrode comprising a metal, (2) the photovoltaic element, and (3) a second electrode. The photovoltaic element comprises an organometallic complex with an org. ligand and a metal (a rare earth, transition metal, lanthanide, or an actinide).

IT 17457-88-4 21392-78-9

(metal chelates in photovoltaic device)

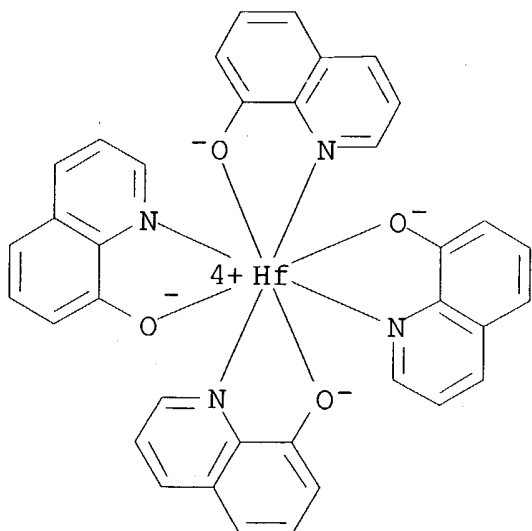
RN 17457-88-4 HCA

CN Zirconium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



RN 21392-78-9 HCA

CN Hafnium, tetrakis(8-quinolinolato-N1,O8)- (9CI) (CA INDEX NAME)



IT 17457-88-4 21392-78-9

(metal chelates in photovoltaic device)

L18 ANSWER 23 OF 25 HCA COPYRIGHT 2004 ACS on STN

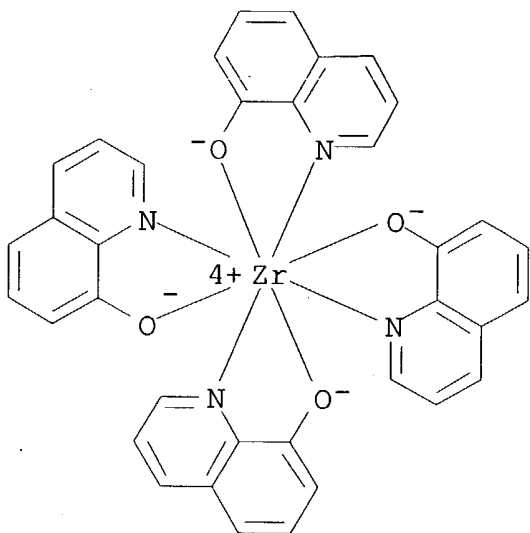
58:30728 Original Reference No. 58:5158d-e Absorption and fluorescence properties of the 8-quinolinol compounds of some elements of the 2nd, 3rd, and 4th Groups of the periodic system. Haar, R.; Umland, R. (Tech. Hoch-schule, Hannover, Germany). Zeitschrift fuer Analytische Chemie, 191, 81-94 (Unavailable) 1962. CODEN: ZANCA8. ISSN: 0372-7920.

AB Absorption and fluorescence spectra in  $\text{CHCl}_3$  are given for the 8-quinolinolates as well as the  $\text{BuNH}_2$ ,  $\text{H}_2\text{O}$ , and  $\text{ROH}$  solvates of Mg, Zn, Cd, Al, Sc, Y, Ce, Nd, Sm, Eu, Gd, Zr, and Hf. Only the diamagnetic metal ion compds. fluoresce. The order  $\text{Hf} < \text{Cd} < \text{Zr} < \text{Y} < \text{Sc} < \text{Mg} < \text{Al} < \text{Zn}$  of fluorescence intensity is discussed.

IT 17457-88-4, Zirconium, tetrakis(8-quinolinolato)-  
21392-78-9, Hafnium, tetrakis(8-quinolinolato)-  
(fluorescence and spectrum of)

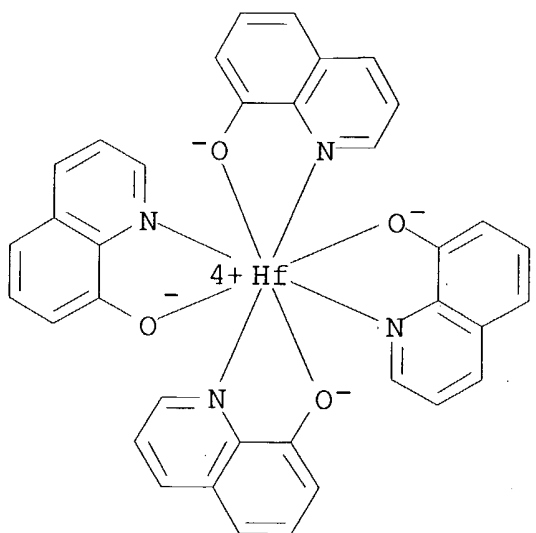
RN 17457-88-4 HCA

CN Zirconium, tetrakis(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA  
INDEX NAME)



RN 21392-78-9 HCA

CN Hafnium, tetrakis(8-quinolinolato-N1,O8)- (9CI) (CA INDEX NAME)



IT 17457-88-4, Zirconium, tetrakis(8-quinolinolato)-  
21392-78-9, Hafnium, tetrakis(8-quinolinolato)-  
(fluorescence and spectrum of)